

**REFLECTOR ANTENNA SYSTEM INCLUDING A PHASED ARRAY ANTENNA  
OPERABLE IN MULTIPLE MODES AND RELATED METHODS**

**Abstract of the Disclosure**

A reflector antenna system may include at least one antenna reflector having an arcuate shape and defining an antenna beam, a feed device spaced apart from the at least one antenna reflector, and a phased array antenna positioned in the antenna beam between the at least one antenna reflector and the feed device. More particularly, the phased array antenna may include a substrate and a plurality of back-to-back pairs of first antenna elements carried by the substrate and configured for defining at least one feed-through zone for the antenna beam. The phased array antenna may further include a plurality of back-to-back pairs of second antenna elements carried by the substrate and defining at least one active beamsteering zone for the antenna beam.